

Amendments of the Claims

The following list of claims replaces all previous version(s) of claims.

1. (Currently Amended) A method of forming a strained Si layer on a SiGe-on-insulator (SGOI) structure with a low stacking fault defect density, the method comprising the steps of:

providing a Si-on-insulator (SOI) substrate having an unstrained Si layer over an insulator;

depositing a first SiGe layer on said Si layer;

thermally mixing said first SiGe layer with said Si layer to transform said first SiGe layer and said Si layer into a relaxed SiGe layer of a first thickness;

thinning said relaxed SiGe layer to a second thickness through an high-pressure oxidation (HIPOX) at temperature range of 550°C-700°C and pressure range of 5ATM-20ATM; and

depositing a strained Si layer on said relaxed SiGe layer.

2. (Original) The method in claim 1, wherein said process of thermally mixing said first SiGe layer with said Si layer comprises heating said first SiGe layer and said Si layer to approximately 1200°C-1300°C in an oxidizing environment.

3. (Original) The method in claim 1, wherein said thinning process non-selectively thins said relaxed SiGe layer such that the Si and Ge within said relaxed SiGe layer are removed proportionately.

4.-7. (Cancelled)

8. (Original) The method in claim 1, characterized in that said second thickness is less than 1000Å.

9. (Original) The method in claim 1, characterized in that said SGOI is more than 60% relaxed.
10. (Original) The method in claim 1, characterized in that said SGOI has less than $1 \times 10^{-4}/\text{cm}^2$ of stacking fault defects.
11. (Original) The method in claim 1, characterized in that said second thickness is less than 500Å.
12. (Original) The method in claim 1, characterized in that said SGOI is more than 80% relaxed.
13. (Original) The method in claim 1, characterized in that said SGOI has less than $1 \times 10^{-2}/\text{cm}^2$ of stacking fault defects.
14. (Currently Amended) The method in claim 1, ~~wherein said thinning comprises an oxidation process and said method further comprises~~ comprising smoothing said relaxed SiGe layer to reduce surface roughness of said SiGe.
15. (Original) The method in claim 14, wherein said smoothing comprises one of:
a touch-up CMP;
an in-situ hydrogen bake and SiGe buffer layer growth before depositing said strained Si layer; and
heating said relaxed SiGe layer in a hydrogen environment with a mixture of gases of HCl, DCS and GeH₄, at temperature of 700°C-900°C.

REMARKS

The present Amendment and Response is intended to be fully responsive to all points of objections and/or rejections raised by the Examiner and is believed to place the application in condition for allowance. Applicant asserts that the present invention is new, non-obvious and useful. Prompt reconsideration and allowance of the claims are respectfully requested.

Status of the Claims

Claims 1-3 and 8-15 are pending in the present application.

Claims 4-7 have been cancelled.

Claims 1 and 14 have been amended without prejudice. Applicants assert that the amendment is fully supported by the specification of record and adds no new matter.

Remarks to Claim Rejections

Claim Rejections - 35 USC §112

The Office Action of June 12, 2008 rejected claims 4, 8, and 11 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to point out and distinctly claim the subject matter which applicants regard as the invention (claim 4), or for insufficient antecedent basis (claims 8 and 11).

Applicants have amended independent claim 1 to provide proper antecedent basis, “a second thickness”, for claims 8 and 11 to depend from.

Applicants have cancelled claim 4 without prejudice.

In view of the above remarks, it is respectfully submitted that rejections of claims 4, 8, and 11 under 35 U.S.C. §112, second paragraph, be withdrawn.